What we claim is:

1. A computer system comprising a plurality of storage units each containing one or more volumes for storing data used by the computer and a management computer for managing the status of the plurality of storage units, comprising:

one or more first-level storage units each containing one or more volumes for storing data used by the computer,

one or more second-level storage units each of which is connected through a communication path to, and hierarchically linked to, one of the first-level storage units and contains one or more volumes for storing data used by the computer,

volume information collecting means for collecting information on the volumes contained in the first-level and the second-level storage units,

hierarchical information collecting means for collecting information on the hierarchical relationships between volumes contained in the first-level storage units and volumes contained in the second-level storage units, and

effective capacity calculating means for calculating the total effective capacity based on the volume information and the hierarchy information thus collected.

2. The computer system of claim 1, wherein the first-level and the second-level storage units each contains one or more virtual storage areas as volumes and the management computer comprises the volume information collecting means, the hierarchy information collecting means, and the effective capacity calculating means.

3. The computer system of claim 1, wherein each of the first-level storage

units comprises means for storing the information on the hierarchical relationships between volumes contained in it and volumes contained in the second-level storage units.

4. The computer system of claim 1, wherein the information collected by the volume information collecting means includes at least the identifier and the information on the capacity of each volume contained in the first-level and the second-level storage units.

5. The computer system of claim 1, wherein the information collected by the hierarchy information collecting means includes the information indicating the relationship between the identifier of each volume contained in the first-level storage units and the identifier of its corresponding volume contained in the second-level storage unit.

6. The computer system of claim 1, wherein the management computer comprises a display for displaying the information collected by the volume information collecting means and the result of the calculation made by the effective capacity calculating means.

7. The computer system of claim 1, wherein the management computer comprises a display that has a first display section for displaying the volume information of the volumes contained in the second-level storage units that are used by the first-level storage units and a second display section for displaying the volume information of other volumes.

8. The computer system of claim 1, further comprising an identifier management computer for managing the formats of the identifiers of the volumes used in it, wherein each of the first-level and the second-level storage units comprises means for inquiring the format of the identifier management computer and means for composing the volume information and

the hierarchy information in accordance with the identifier format held in the identifier management computer.

9. A management computer for managing the status of storage units containing volumes for storing data used by a computer, executes:

volume information collecting program for collecting information on the volumes from one or more first-level storage units containing volumes for storing data used by the computer and from one or more second-level storage units each of which is connected through a communication path to, and hierarchically linked to, one of the first-level storage units and contains at least one volume for storing data used by the computer;

hierarchy information collecting program for collecting information on the hierarchical relationships between volumes in the first-level storage units and volumes in the second-level storage units; and

effective capacity calculating program for calculating the total effective capacity based on the volume information and the hierarchy information thus collected.

10. The management computer of claim 9, further comprising a display for displaying the information collected by the volume information collecting program and the result of the calculation made by the effective capacity calculating program.

11. The management computer of claim 9, further comprising a display for displaying information on the volumes in the first-level storages that are made available to the computer and an input device for inputting information on volumes, wherein

information on volumes is displayed on the display as objects, and when a specific object on the display is selected by the input device,

the corresponding volume in the second-level storage unit located through the hierarchy information will be identified, and the corresponding volume information obtained by the volume information collecting means from the corresponding volume will be displayed on the display.

12. The management computer of claim 9, further comprising a display equipped with a screen having a first display section for displaying information on the volumes contained in second-level storage units that are used by the first-level storage units and a second display section for displaying information on other volumes.

13. The management computer of claim 9, further comprising a display for displaying as objects volume information of the volumes in the first-level storage units collected by the volume information collecting means, wherein

a first object indicating that the volume in a first-level storage unit is actually provided by a volume in a second-level storage unit and a second object representing the volume in the second-level storage unit that is actually provided as the volume in the first-level storage unit are displayed on the display in such a way as to reflect the hierarchical relationship between them.

14. The management computer of claim 10, wherein on the display either a screen where information on volumes in the second-level storage units that are used by the first-level storage units is hidden or a screen showing information on volumes in the second-level storage units that are not used by the first-level storage units is selectively displayed.

15. A management method for managing, using a management computer,

capacities of volumes storing data used by a computer, comprising the steps of:

providing a volume in a first storage unit for storing data used by the computer,

establishing a hierarchical relationship between the first storage unit and a second storage unit that allows a volume to be shared between the two,

collecting from the first storage unit information on the volumes contained in it,

collecting from the second storage unit information on the volumes contained in it,

collecting information on the hierarchical relationships between the volumes contained in the first storage unit and the volumes contained in the second storage unit, and

calculating the total effective capacity to the computer based on the information on the volumes and the information on the hierarchical relationships.

16. The management method of claim 15, further comprising a step of displaying on a display the collected information on the volumes and the calculated total effective capacity.

17. A program designed to run on a management computer for managing the storage capacities of storage units containing volumes for storing data used by a computer, comprising:

means for collecting from a first storage unit information on the volumes contained in it for storing data used by the computer,

means for collecting from a second storage unit having a hierarchical

relationship with the first storage unit information on the volumes contained in it,

means for collecting information on the hierarchical relationships between the volumes contained in the first storage unit and the volumes contained in the second storage unit, and

means for calculating the total effective capacity based on the information on the volumes and the information on the hierarchical relationships thus collected.

18. A storage medium on which the program of claim 17 is stored.

19. The storage management system of claim 1, further comprising an identifier management computer connected through the communication path to the first-level storage units, the second-level storage units, and the management computer, wherein the identifier management computer stores in a memory located in it, and manages, identifiers for identifying the first-level and the second-level storage units in a standardized format, and upon receiving a request for identifier format information from one of the first-level or the second-level storage units or the management computer, retrieves the requested identifier format information from the memory, and sends the requested identifier format information to the first-level or the second-level storage unit or the management computer requesting it.

20. The management method of claim 15, further comprising

a step of registering in a memory, and managing, identifier format information for identifying the first-level storage units and the second-level storage units in a standardized format, wherein

the management computer, when started up, retrieves the identifier

format information from the memory, and, when collecting from the first-level and the second-level storage units information on the volumes contained in them and when collecting information on the hierarchical relationships between them, obtains the information thus collected based on the identifier format information.

21. The management method of claim 20, wherein the identifier format information that is registered and managed includes at least the vendor name, the model name, and the volume number of the first-level or the second-level storage unit, as the case may be.

22. The management method of claim 16, wherein the screen of the display has a display section for displaying the identifier, capacity, and associated icon of each upper-level volume, a display section for displaying the identifier, capacity, and associated icon of each lower-level volume, and a display section for displaying the total available capacity.

23. In a computer system including one or more first-level storage units each containing one or more volumes for storing data used by a computer, one or more second-level storage units each of which is connected through a communication path to, and hierarchically linked to, one of the first-level storage units and contains one or more volumes for storing data used by the computer, and a management computer for managing the status of the volumes contained in the first-level and the second-level storage units, a management method for managing the volumes contained in the first-level and the second-level storage units comprising: providing volumes in the first-level storage units for storing data used by the computer,

establishing a hierarchical relationship between one of the first-level

storage units and one of the second-level storage units that allows

a volume to be shared between the two,

storing in a memory located in each of the first-level and the

second-level storage units identifier format information in a

standardized format for identifying the first-level and the

second-level storage units, respectively,

issuing a request for volume information from the management computer

to the first-level and the second-level storage units,

consulting the identifier format information stored in the memory in

each of the first-level and the storage-level storage units upon

receiving the request for volume information, and sending to the

management computer the volume information including the number of

volumes contained in it, their identifiers and their capacities in the

format specified in the identifier format information,

issuing a request for inter-volume hierarchy information from the

management computer to the first-level and the second-level storage

units,

consulting the identifier format information stored in the memory in

each of the first-level and the storage-level storage units, upon

receiving the request for inter-volume hierarchy information, and

sending to the management computer the inter-volume hierarchy

information contained in it in the format specified in the identifier

format information,

composing, based on the volume information and the inter-volume

hierarchy information thus collected, a consolidated information table

including an upper-volume column containing the identifier, capacity, icon number, a flag indicating the existence of subordinate volumes for each volume belonging to the higher level of hierarchy, and a lower-volume column containing the identifier, capacity, and icon number for each volume belonging to the lower level of hierarchy in the management computer,

registering the consolidated information table in a memory,

displaying the contents of the consolidated information table retrieved from the memory in at least three display sections of the display: a display section for displaying the identifiers, capacities, and associated icons, among other things, of the volumes belonging to the higher level of hierarchy, a display section for displaying the identifiers, capacities, and associated icons, among other things, of the volumes belonging to the lower level of hierarchy, and a display section for displaying the total available capacity among other things.

24. A management computer for managing the status of storage units containing volumes for storing data used by a computer, comprising:

CPU and a network interface unit connected a management network,

wherein CPU collects information on the volumes from one or more first-level storage units containing volumes for storing data used by the computer and from one or more second-level storage units each of which is connected through a communication path to, and hierarchically linked to, one of the first-level storage units and contains at least one volume for storing data used by the computer, and information on the hierarchical relationships between volumes in the first-level storage units and volumes in the second-level storage units via said

network interface,

and calculates the total effective capacity based on the volume

information and the hierarchy information thus collected.

25. The management computer of claim 24, further comprising a display for

displaying the information collected and the result of the calculation by

said CPU.